

PHYS 2300 UNIVERSITY of DENVER Winter 2008
Physics of the Body
3 credits

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Class schedule: Tuesday and Thursday 2:00-3:30 PM Olin 205

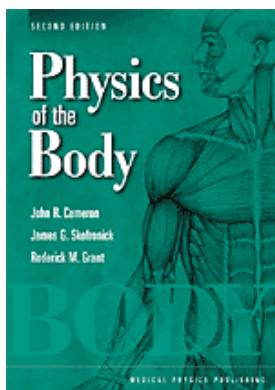
Office hours: Tuesday and Thursday 3:30-4:30 PM or by appointment

Course objectives:

Give an understanding of the function of body organs and systems in terms of basic physics principles. It provides a good preparation for medical, dental and bio-related graduate school or a health-related career in the sciences or engineering.

Course description: This is the first course required for a Medical Physics Minor. It is followed by the Medical Imaging Physics, which is offered in Spring Quarter. Muscles and forces; physics of the skeleton; energy, heat, work and power of the body; osmosis and kidneys; lungs and breathing; cardiovascular system; electrical and magnetic signals in the body. **Prerequisites:** PHYS 1113 and 1123 or PHYS 1213 and PHYS 1223.

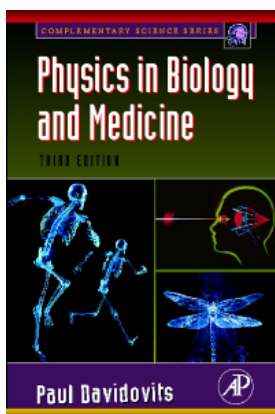
Required textbooks:



Physics of the Body by J. R. Cameron, J. G. Skofronick, and R. M. Grant, 2nd Ed., Medical Physics Publishing.

This book is intended primarily for students who plan to make a career in some field of medicine. The authors rely on basic physics principles to promote an understanding of the function of the various organ systems of the body such as the eyes, ears, lungs, and heart. Although it was written primarily as a text for students who have some knowledge of elementary physics, it will be interesting and understandable to any person who is curious about how his/her body works. The mathematics is at the algebra level.

(Reprinted from the Medical Physics Publishing Web site)



Physics in Biology and Medicine by P. Davidovits, 3rd Ed. Elsevier.

Physics for Biology and Medicine, Third Edition covers topics in physics as they apply to the life sciences, specifically medicine, physiology, nursing and other applied health fields. This concise introductory paperback surveys and relates basic physics to living systems. (Reprinted from the Elsevier Web site).

Supplementary reading:

Biological Physics (Energy, Information, Life), by Philip Nelson, Freeman, 2004.

This text is at more advanced undergraduate level, mathematically more intense.

Prerequisites:

- Basic algebra-based physics
- Elementary chemistry and biology

The following are some of the recommended basic physics textbooks, if some material needs to be reviewed:

- John D. Cutnell, Kenneth W. Johnson, Physics, Wiley (algebra-based).
- Douglas C. Giancoli, Physics: Principles with Applications, Prentice Hall (algebra-based).
- David Halliday, Robert Resnick, and Jearl Walker, Fundamentals of Physics, Wiley (calculus-based).
- Larry Gonick and Art Huffman, The Cartoon Guide to Physics, HarperPerennial.

Student evaluation:

Based on:

- Homework (25 %)
- Quizzes (20 %)
- Term paper (20 %)
 - Outline due on January 17
 - Paper due on March 6
- Midterm exam (10 %)
 - February 7 (tentatively)
- Final exam (25 %)
 - March 6 2:00-3:50 (last class)

Late-paper and attendance policy:

2 missing papers (1 homework and 1 quiz) are allowed (grade drops afterward). Both exams must be attended or absence documented by a note from a doctor.

Important note:

Students must comply with University Honor Code

(<http://www.du.edu/ccs/honorcode.html>). Plagiarism is a serious offense and a basis for failing the course.

Schedule

Week	Topic
1	Introduction Modeling and Measurement Energy, Heat, Work, and Power of the Body
2	Muscles and Forces
3	Physics of the Skeleton
4	Pressure in the Body
5	Osmosis and the Kidneys
6	Lungs and Breathing
7	Cardiovascular System
8	Electrical Signals from the Body
9	Sounds and Speech
10	Ear and Hearing Eyes and Vision